Alg. 2 Warm Up # 7-3 Simplify:

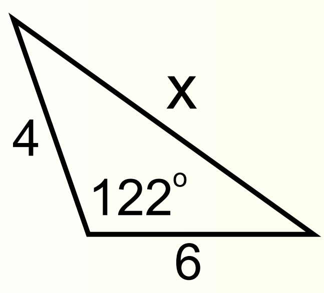
1. $\sqrt{48}$

2. $\dfrac{1}{\sqrt{2}}$

3. $\dfrac{6}{\sqrt{75}}$

(look in your glossary)

4. Solve using Law of Cosines:



HW Questions: (purple WS)

Alg 2B Ch. 7 Prep Name ______________ Tea

Simplify. (Rationalize denominator & reduce fraction.) F

1) $\frac{3}{\sqrt{6}} \cdot \frac{\sqrt{6}}{\sqrt{6}}$

$\frac{3\sqrt{6}}{6}$

$\boxed{\frac{\sqrt{6}}{2}}$

2) $\frac{1}{\sqrt{2}} \cdot \frac{\sqrt{2}}{\sqrt{2}}$

$\boxed{\frac{\sqrt{2}}{2}}$

3) $\frac{6\sqrt{2}}{\sqrt{6}}$

$6\sqrt{\frac{2}{6}}$

$\frac{6\sqrt{1}}{\sqrt{3}} \cdot \frac{\sqrt{3}}{\sqrt{3}}$

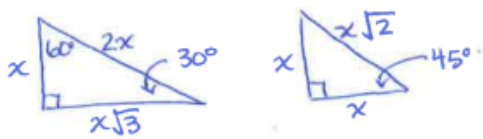
$\frac{6\sqrt{3}}{3}$

$\boxed{2\sqrt{3}}$

4) $\frac{2}{\sqrt{3}} \cdot \frac{\sqrt{3}}{\sqrt{3}}$

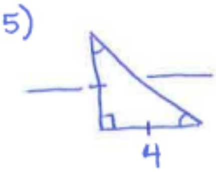
$\boxed{\frac{2\sqrt{3}}{3}}$

Remember Special Δ's:



Find the missing sides of the Special Δ's:

5)



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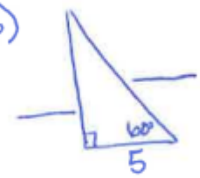

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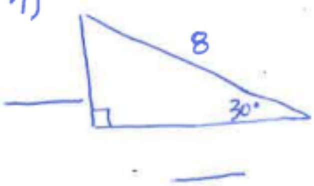

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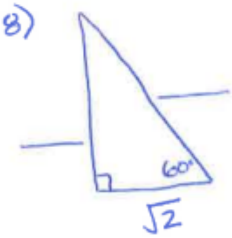

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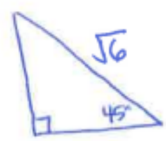

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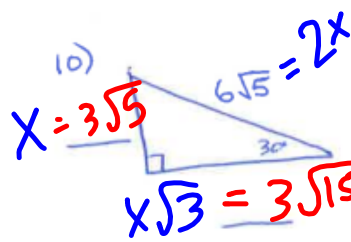


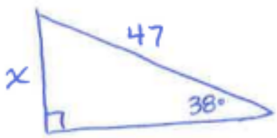
$$x\sqrt{3} = 3\sqrt{5}\cdot\sqrt{3}$$
$$= 3\sqrt{15}$$

$$\frac{6\sqrt{5}}{2} = \frac{\cancel{2}x}{\cancel{2}}$$

$$\boxed{x = 3\sqrt{5}}$$

Use sine, cosine and tangent relationships to calculate the missing side. Round to 2nd decimal place. (SOHCAHTOA, Not Law of Sines)

Example:

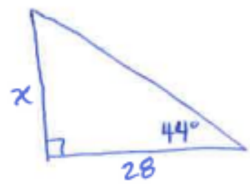


$\sin 38° = \frac{x}{47}$

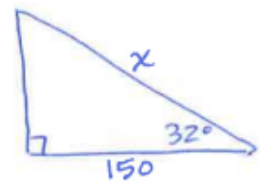
$x = 47(\sin 38°)$

$x \approx 28.94$

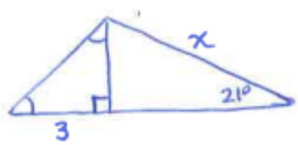
11)



12)

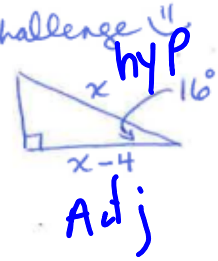


13)



*challenge

14)



$$x \cdot \cos 16 = \frac{x-4}{\cancel{x}} \cdot \cancel{x}$$

$$x\cos 16 = x - 4$$

$$x\cos 16 - x = -4$$

$$\frac{x(\cancel{\cos 16° - 1})}{\cancel{\cos 16° - 1}} = \frac{-4}{\cos 16° - 1}$$

Simplify.

15) $\dfrac{x^2-2x-3}{2x^2+x-1} \cdot \dfrac{2x^2+9x+5}{x^2-9x+18}$

16) $\dfrac{5x-15}{4x-12} + \dfrac{6x-8}{2x}$

Solve by completing the square: (Answer exact & simplified.)

17) $x^2 - 6x - 3 = 0$

18) $x^2 + 8x - 2 = 0$

19) $2x^2 - 8x + 1 = 0$

20) $3x^2 - 18x - 4 = 0$

Write the equation in standard form & state the center & radius.

21) $x^2 + y^2 - 2x + 8y - 3 = 0$

$$(x-h)^2+(y-k)^2=r^2$$

$$(x^2-2x+\underline{1})+(y^2+8y+\underline{16})=3$$

$+1$

$+16$

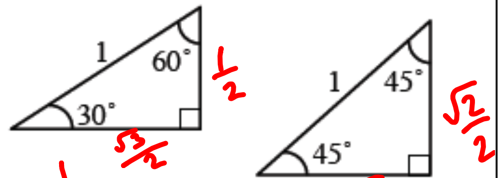
$$\frac{-2}{2}=(-1)^2 \qquad \frac{8}{2}=(4)^2$$

$$(x-1)^2+(y+4)^2=20$$

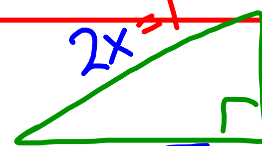
$C\,(1,-4)$ $\quad r=\sqrt{20}$

$$\boxed{r=2\sqrt{5}}$$

7-6. Copy the triangles at right and label the missing side lengths.



Math Spiral:

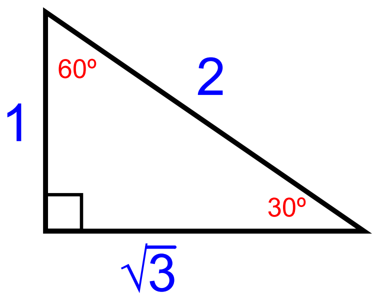


$2x = 1$

$x = \frac{1}{2}$

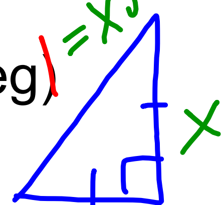
$x\sqrt{3} = \frac{\sqrt{3}}{2}$

30º - 60º - 90º hyp = 2 (sh. leg)



long leg = √3 (sh. leg)

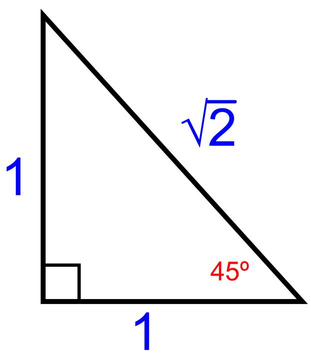
$1 = x\sqrt{2}$



$x = \frac{1}{\sqrt{2}} \cdot \frac{\sqrt{2}}{\sqrt{2}}$

45º - 45º - 90º hyp = √2(leg)

$x = \frac{\sqrt{2}}{2}$



CP's: 7- # 12, 13

7.1.2 How can I graph it?

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Graphing the Sine Function

Today you will use what you know about right-triangle relationships and graphing functions to investigate a new function.

7-12. "*HURRY!!! Let's get there before the line gets too long*!" shouts Antonio to his best friend René as they race to get on *The Screamer*, the newest attraction at the local amusement park.

"*It's only been open for one day, and already everyone is saying it's the scariest ride at the park!*" exclaims Antonio. "*I hear they really had to rush to get it done in time for summer*."

Antonio whistles as he screeches to a halt in front of the huge sign that says, "*Welcome to The Screamer, the Scariest Ride on Earth*." The picture below it shows an enormous wheel that represents *The Screamer*, with its radius of 100 feet. Half of the wheel is below ground level, in a very dark, murky pit with water at the bottom. As *The Screamer* rotates at dizzying speeds, riders fly up into the air before plunging downward through blasts of freezing air, hair-raising screams, and sticky spider webs into the pit where they splash through the dark, eerie water on their way back above ground.

René and Antonio wait impatiently to get on the ride, watching passengers load and unload. New passengers get on and strap themselves in as others emerge from the pit looking queasy. The ride rotates 15° to load and unload the next set of riders. As René straps himself in, he remembers Antonio's ominous words: "*I hear they really had to rush to get it done in time for summer*."

Sure enough, just as the ride plunges René and Antonio into the greasy water, they hear the piercing scream of metal twisting. Sparks fly and the pit fills with smoke as the ride grinds to a halt. To escape, all of the passengers must climb vertically to ground level from wherever they got stuck, either up from the pit or down from dizzying heights.

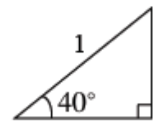
Your Task: Find a function that describes the distance each passenger must climb in order to escape from the broken ride, *The Screamer*.

a. Follow the directions on the CP worksheet, instead of the book.

b. Graph your data on a large graph.

c. Suppose you were asked to add 20 more data points to your table. What shortcuts could you use to reduce the amount of work?

7-13. The function that models the situation in problem 7-12 is a new parent function. To help you figure out what it is, sketch the right triangle shown in the diagram at right.



a. With your team, write an equation and use it to calculate the height of the triangle. Does the calculated escape height seem reasonable when compared to the data you collected in problem 7-12?

b. Write an equation representing the escape height $h(\theta)$ for *any* passenger, that is, for any angle of rotation of *The Screamer*. Note that the symbol θ is the angle represented by the Greek letter "theta."

c. Enter the data from the first two columns of your table into your graphing calculator. Adjust the viewing window so you can see all of the data. Then graph $h(\theta)$ on top of the data. How well does $h(\theta)$ fit your data?

d. Adjust the viewing window so that you can see more of the graph of $h(\theta)$. Describe the behavior of the graph as θ gets larger. Does this make sense? Why or why not?

e. Use the 'table' function of your calculator to find the values that it calculated for $h(\theta)$. Add another column to your table from problem 7-12, label it with the equation you found for $h(\theta)$, and enter these values, rounding off to the nearest hundredth. How do the calculated values compare with your measured ones?

HW: 7-

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